

Application No. 10/539,676
Amendment Dated January 4, 2007
Reply to Office Action of October 10, 2006

REMARKS

The Office Action mailed October 10, 2006 has been carefully considered by applicant. Reconsideration is respectfully requested in view of the enclosed substitute specification, the foregoing claim amendments, and the remarks that follow.

SPECIFICATION

Herewith applicant submits a substitute specification in accordance with the requirements set forth on page 2 of the Office Action. No new matter is added by the substitute specification. The specification is thus believed in condition for allowance.

CLAIM REJECTIONS

Claims 1-3 and 6 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Willhite et al. U.S. Patent No. 3,511,282. Claims 4, 5 and 7 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Willhite et al. '282.

Claims 1-7 are cancelled and replaced with new claims 8-14. Claims 8-14 are believed allowable over the cited references for the reasons that follow.

A significant drawback of known well perforating technology is that perforation debris often clogs the perforation tunnels, thus causing fluid friction and lower production rates. The present invention overcomes this drawback by providing a method and casing for stimulating and clearing the perforation tunnels immediately after the perforation is completed. The invention therefore advantageously prevents excess fluid friction during well production and avoids lower production rates.

Claim 8

Claim 8 recites a method of perforating a well that extends into a surrounding formation. A casing is permanently installed in the well. The casing includes an inner pipe, an outer pipe, and end subs which together define an integrated annular space enclosing a well stimulating medium. The inner and outer pipes are perforated to form a communication pathway between the integrated annular space and the surrounding formation. Advantageously, the pressure differential between the

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stimulating medium and the surrounding formation causes the removal of perforating debris from the communication pathway.

In most applications, the well and reservoir will have a pressure of several thousand psi at production depth. Therefore, when perforating through the installed casing at this depth, the integrated annular space will act as a vacuum and suck perforation debris out of the perforation tunnels. As stated above, this results in cleaner perforation tunnels, which leads to less pressure drop when producing the well.

Willhite et al. '282 fails to teach or suggest the claimed method, or the advantages provided by the claimed method. Initially, Applicant notes that Willhite et al. '282 does not relate to perforating a production well. In contrast, Willhite et al. '282 teaches an arrangement having two pipes and an annular space, where the inner pipe is pre-stressed before assembly with the outer pipe. The purpose of pre-stressing the inner pipe is to minimize elongation and buckling effects, etc. when the inner pipe is subjected to higher temperature than the outer pipe.

Admittedly, Willhite et al. '282 teaches an annular space that is filled with fluid and gases. However, the purpose of the annular space is to act as an insulator when, for example, hot fluids are pumped through the conduit or produced from a well. The annular space is intended to protect the surroundings from being negatively affected by heat. The media taught by Willhite et al. '282 is directed to adjustment of density and for heat conductivity. There is no teaching whatsoever in Willhite et al. '282 of the claimed "well stimulating medium". There is also no teaching whatsoever in Willhite et al. '282 of the method step of perforating the inner pipe and outer pipe to form a communication pathway between the integrated annular space and the surrounding formation, and such that the pressure differential between the stimulating medium and the surrounding formation causes the removal of perforating debris from the communication pathway.

In paragraph 6 of the Office Action, the Examiner makes several statements regarding his conclusions of what "would have been obvious". For example, the Examiner states that it would have been obvious to put well stimulating fluids in the

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isolated annulus space in order to transport well stimulating fluids to the wellbore. The Examiner also states that it would have been obvious to put scale inhibitors in the isolated annulus space in order to transport scale inhibitors to the wellbore. Further, it is stated that it would have been obvious to put a solid material that is transformed into gas when the inner and outer walls are perforated.

Applicant respectfully, yet strongly disagrees with the Examiner's conclusion in paragraph 6 of the Office Action and requests that the Examiner cite a reference in support thereof. Prior to the present Application, there is no teaching or suggestion in the art of the claimed method steps, including permanently installing a casing in a well, wherein the casing has an integrated annular space comprising a well stimulating medium. This method step is simply not taught in the art. There is also no teaching or suggestion of perforating the inner pipe and outer pipe to form a communication pathway between the integrated annular space and the surrounding formation and such that the pressure differential between the well stimulating medium and the surrounding formation causes the removal of perforating debris from the communication pathway. Without the disclosure of the present Application, one would not be motivated to complete the claimed method steps. This is evidenced by the fact that Willhite et al. '282 is over 35 years old and the apparatus described in this patent has never been used for the purpose of permanently installing the apparatus in a well and perforating through the apparatus to obtain positive effect from the media contained in the annular space.

Regarding the conclusions set forth in paragraph 6 of the Office Action, applicant also respectfully asserts that the Examiner is unfairly relying on the teachings of the present Application. It is well established that one cannot use hindsight reconstruction to deprecate the claimed invention.

Applicant also stresses that the age of the reference indicates a lack of teaching or suggestion of the invention.

Claim 8 is therefore believed allowable over the cited reference.

Claim 9

Claim 9 recites a method of communicating a well stimulating medium contained in an annular space integrated in a portion of a casing permanently installed in a well. Claim 9 includes the step “wherein the well stimulating medium is communicated with a formation surrounding the casing by simultaneous perforation of said inner and outer pipe”. For the reasons stated above, claim 9 is also not anticipated or rendered obvious by the cited reference.

Claims 10 and 11

Claims 10 and 11 depend from claim 9 and are believed allowable for the reasons stated above, as well as the subject matter recited therein.

Claim 12

Claim 12 recites a casing that is permanently installed in a well. An integrated annular space is defined by an outer pipe, inner pipe and two end subs. The integrated annular space comprises a well stimulating medium that is a fluid having a pressure that is substantially lower than the pressure in the formation surrounding the annular space. The annular space is capable of being perforated simultaneously. For the reasons stated above regarding claim 8, the prior art fails to teach or suggest the claimed invention. As such, claim 12 is believed allowable over the prior art.

Claim 13

Claim 13 depends from claim 12 and is thus believed allowable for the reasons stated above, as well as the subject matter recited therein.

Claim 14

Claim 14 recites a casing permanently installed in a well, including an inner pipe, an outer pipe and two end subs disposed at each end portion of the inner and outer pipes. An integrated annular space is defined by the casing and comprises a well stimulating medium. The annular space is capable of being perforated simultaneously and the well stimulating medium is a solid material capable of being transformed into gas when the annular space is perforated.

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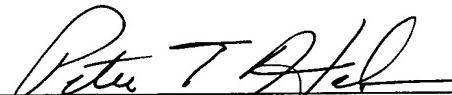
The prior art fails to teach or suggest providing well stimulating medium in the claimed integrated annular space, wherein the well stimulating medium is a solid material capable of being transformed into gas when the annular space is perforated. With respect, the statements made by the Examiner in paragraph 6 of the Office Action are simply not correct. The age of the Willhite et al. '282 patent is itself evidence of the fact that it would not have been obvious to permanently install the claimed casing in a well wherein an integrated annular space has a well stimulating medium that is a solid capable of being transformed into a gas when the annular space is perforated. Also, Willhite et al. '282 does not teach or suggest the claimed solid material capable of being transformed into a gas when the annular space is perforated. In fact, Willhite et al. fails to teach or suggest perforation of the casing. As such, claim 14 is believed allowable over the Willhite et al. '282 reference.

CONCLUSION

The present Application is thus believed in condition for allowance. Such action is respectfully requested.

Respectfully submitted,

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